Strategic Skills Initiative

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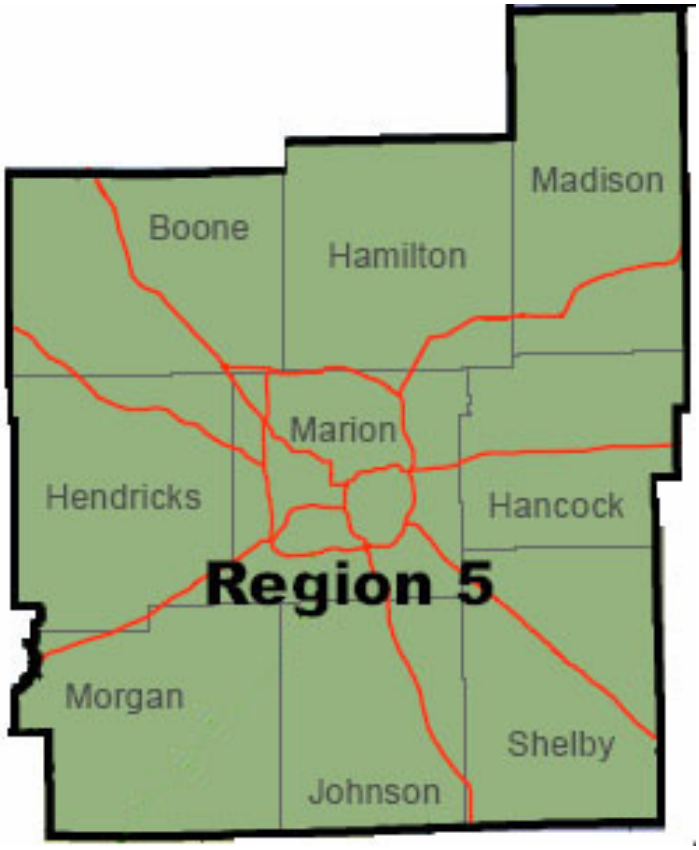
Root Causes Report

Executive Summary

Economic Growth Region 5

Dec. 30, 2005



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Economic Growth Region 5

I. Introduction

Economic Growth Region 5 comprises nine counties in central Indiana. They are Boone, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan and Shelby. The region combines two workforce investment areas: the Central Eight Workforce Investment Board and the Indianapolis Private Industry Council. EGR 5 is the largest of Indiana's development regions, with a population of 1.7 million people and a workforce of more than 888,000 workers.

In June 2005, the state of Indiana announced a $23 million initiative called the Innovating Indiana Strategic Skills Initiative with the goal of building regional and local capacity among the workforce and economic development organizations. The purpose of the initiative was to partner workforce development professionals with local and regional businesses and economic development officials to identify key occupational and skill shortages, their root causes and a regional solution to the problems.

In the first phase of the Strategic Skills Initiative, the cooperating agents in EGR 5 sifted data and tapped local expertise to select four key industries. Then the entire staffing structure of these industries was assessed to create a short list of occupations with skill shortages. These are: registered nurse, licensed practical nurse, allied medical professional, nursing aide, automotive service technician, machinist, production machine operator, welder, precision inspector and tester, chemical machine operator, supervisor of transportation workers, truck driver and warehouse laborer.

This Root Causes Report explains the skill shortages in the critical occupations. As instructed in the SSI Research and Identification Guidebook, we separately describe the contributions of demand and supply factors, as well as the effects of demographic and geographic factors. The methodology is discussed fully in the Methodology section below (see pp. 70-73 in Root Causes Report).

The cost of chronic skill shortages

The Strategic Skills Initiative is designed to identify, understand and solve chronic skill shortages. Employers say that finding qualified workers is a constant challenge to them. We have heard from employers who say they would hire 50 or even 100 workers tomorrow, if they could be found, and that from the start of a year to the end their company is never fully staffed (see pp. 2-3 in Root Causes Report).

Skill shortages have serious consequences for businesses. Although a smaller roster would suggest payroll savings, it actually costs more. If a company is short-staffed, it pays overtime wages or hires expensive contract or temporary workers.

One regional hospital reports that short-term contract nurses sometimes cost more than twice the standard rate. But the hospital is obliged to provide a standard of care, which is measured in part by the ratio of registered nurses to patients. The same source suggests that hospitals sometimes leave beds vacant rather than admit patients while the hospital is understaffed. When technicians are unavailable, patients will be sent home and their treatment rescheduled. This leads to patients' dissatisfaction with the quality of care. It also causes the additional, unnecessary clerical expense of rescheduling a patient.

In manufacturing and logistics, too, chronic understaffing leads to problems beyond added cost. The safety of workers and the quality of output suffers when too few people work too many hours. The trucking profession recognizes this and limits the hours a trucker may drive before he must get off the road to rest.

The apparent solution to staffing shortages aggravates the problem. When workers are compelled to work extra hours and unwanted shifts, they become frustrated. Eventually they quit, making the employer even more short-staffed.

There is a future cost of the skill shortage as well. The current workforce is aging. Up to half the employees in some industries will retire in the next decade. There will be too few people to fill the slots left empty by retirees in some areas of the United States. We do not expect a shortage of workers in EGR 5, yet we share the concern. Job-related skill and knowledge must be passed to a new generation. That new generation needs to be on the job now, working alongside its experienced elders and learning from them. Even if an adequate number of individuals steps up after 2010 to fill the vacancies left by retirees, those new workers will lack the experience needed to do their jobs well.

II. Methodology

The Root Causes Report is based on interviews and discussion with experts, as well as analysis of secondary data and original data collected by the participants. Some of the research was performed by the primary agents of the project, and some was provided by members of the consortium. We have complied with the instructions conveyed through the guidebook, webinars and memoranda.

The earlier Occupations and Skill Shortages Report was an exercise in data analysis, but this new phase of the Strategic Skills Initiative called for a different approach. The baseline criteria were set in the SSI Handbook, version 2.0. The EGR 5 report adheres to the instructions in the handbook. We have diverted from the recommended methodology only by considering an additional factor, as discussed below. We have considered each of the recommended possible root causes, including:

- Human resources capacity
- Educational capacity
- Wages
- The pipeline
- Brain drain

Our report discusses each of these issues in general terms first, and then again as the issue affects the particular occupation. Some issues are discussed in greater detail, and some briefly. A briefer treatment does not imply that an issue was ignored, but only that the investigation turned up a very simple and straightforward finding with respect to that issue. If the treatment of the issue does not seem complete in the occupational section, the reader will please refer to the main report.

We have added one additional criterion. This is the emergence of the Hispanic/Latino labor force. The Hispanic/Latino population is active in the labor market and is respected by employers in the community. Hispanic/Latino workers are not a root cause of existing shortages, but they may be part of a future solution.

The general methodology of the project involved iterations of research, discussion, revision and further research. In more detail, the process followed these steps:

1. Gathered pertinent, current data
2. Gathered useful reports and analysis relevant to the subject
3. Read and assessed the available information and produced “strawman” conclusions
4. Presented the “strawman” findings to experts
5. Revised the findings and conclusions as recommended by experts
6. Assigned relative weights and values to each factor
7. Presented the entire report to the consortium for approval
8. Revised the report as recommended by the consortium.

We relied on the principle of the “strawman” during this process. A strawman is a target, set up to be knocked down. In our application, the strawman was the set of preliminary assumptions that we presented to our consortium. We came to the experts and industry representatives prepared with data, assumptions and conclusions. The experts always were asked to supplement our data, and to correct, refine or, if necessary, contradict our assumptions. Later, we returned to those same experts with revised data, assumptions and conclusions. Each iteration brought the process closer to consensus, as well as to the ultimate root causes of the shortages in our region.

A great variety of sources was used in the compilation of this report. The human resources capacity element of the report was aided by original research by the Greater Indianapolis Chamber of Commerce and the Indianapolis Private Industry Council a year ago. Data on educational capacity were obtained from the Indiana Commission for Higher Education, the Indiana Commission on Proprietary Education, Ivy Tech Community College of Indiana and the Indiana Bureau of Motor Vehicles.

Wages were the only area subjected to a detailed analysis of data. We relied on the wage files in the SSI data packet. To understand the pipeline of new workers feeding into an occupation, we relied on the Learn More Indiana Resource Center Web site, which provides career plan information from Indiana high schools. These data show which occupations attract the students’ interest and which the students disdain.

In the pipeline section, we also consider the career ladders that lead into the occupation. The career ladders considered here are very specific to the occupation and answer the question, “How does a person qualify for this job?” Many career ladders present a number of related occupations in order from entry-level to advanced positions. But these “ladders” do not represent a realistic career path for an individual. Realistic career ladders describe the actual paths that an individual may, and that the majority of individuals do, follow to reach an occupation. These genuine career ladders usually are very short.

The best work in Indiana on the subject of the brain drain was performed five years ago by the Indiana Fiscal Policy Institute and the Indiana Commission for Higher Education. No more recent source has provided the degree of detail necessary to our purposes. We therefore have relied on the Indiana Human Capital Retention Study.

The discussion of the Hispanic/Latino workforce relied on interviews and a forthcoming report: "Hispanic/Latino Needs in the Indianapolis Area: An Initial Overview," by the Center for Urban Policy and the Environment.

The rating system

The following table describes the rating system used in this report. The five-point scale effectively encapsulates several criteria:

- Is there a deficiency in the factor?
- How reliable are the sources of information about the deficiency?
- How large or significant is the deficiency?
- Do members of the consortium agree on the findings?
- Is there an apparent solution to the problem?
- Does the apparent solution lie within the purview of the consortium and its partners?

The table shows an ordinal ranking scale of 1 through 5. Factors rated with a "5" are most soluble, and will receive the most attention in the third phase of the Strategic Skills Initiative in EGR 5. Those rated "4" also warrant attention. Factors rated "3" also bear on the skill shortage to a recognizable degree. Factors rated "2" and "1" will not be considered during the solutions phase, as their influence is unclear or else not problematic.

Score	Significance
5	*A deficiency exists in this factor and the causal linkage is strong. Consensus is strong. Remedial actions are within the scope of the consortium.*
4	*A deficiency exists in the factor and the causal link is strong. Remedial actions lie within the normal scope of the consortium and its partners.*
3	*A deficiency exists, but it is not clear that it causes the skill shortage.*
2	*It is unclear if there is a deficiency in this factor, or if the supposed deficiency causes the shortage.*
1	*There is no deficiency in this factor, and no apparent causal linkage between this factor and the shortage.*

III. Description of root causes and their impacts

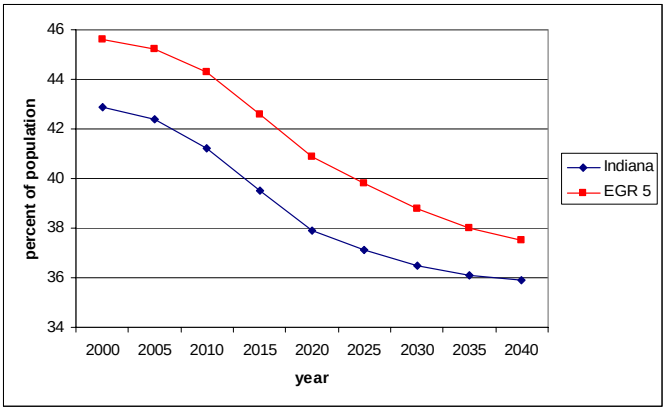
<u>The bottom line</u>

Educational capacity and the pipeline of new workers are the two most serious fundamental causes of skill shortage. For medical professions, the problem is a bottleneck in training. There are too few instructors to staff the medical and nursing programs. For the automotive, manufacturing and logistics occupations, there are too few applicants. We think it is because these industries have poor public images, leading high school students to overlook the good opportunities available to them.

<u>Demographic trends</u>

EGR 5 is relatively well-situated to weather the national demographic crisis. The number of people in their prime working years between 25 and 55 will begin to fall by 2010 and continue falling until 2040. This trend will affect EGR 5, but its effects will be milder here than in other parts of the state and nation. Vince Thompson, economic research analyst at the Indiana Business Research Center, says EGR 5 will maintain an advantage over the rest of Indiana and many, but not all, of the states.

The chart at right shows that, in both EGR 5 and across the state, adults in their prime working years will decline as a share of the population. EGR 5 has a greater share of working adults to start with, and still will have more than the rest of Indiana throughout the years to come. EGR 5 does not expect an actual decline – just a relative one. The number of working-age adults should grow from its current 777,352 to 808,924 in 2020 and 814,079 by 2040. The working adults' group will grow, albeit more slowly than older and younger groups. Across the state, Thompson expects a decline in the number of working adults, making the trend worse elsewhere than in EGR 5.



Our region contains the city of Indianapolis – the only major metropolitan city in Indiana. The region has a drawing power for many people because of professional sports, entertainment venues and other amenities. Three of the fastest-growing counties in Indiana lie within EGR 5. It is simply bigger than any of the other regions. This gives it a "critical mass" of jobs that attracts prospective workers.

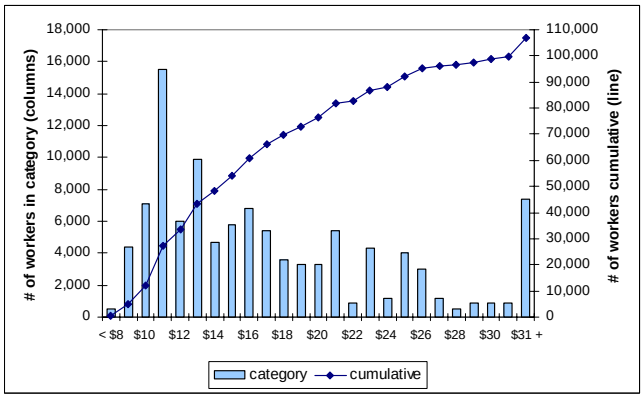
There is no shortage of workers

There is not a shortage of workers. There will be mismatches between people and jobs, leading to skill shortages. But there will not be a shortage of people in the labor force.

The Indy Partnership's "Labor Availability Report," issued in August 2005, describes available workers, including the unemployed and the underemployed. Since most companies prefer to lure current workers from other jobs rather than recruit from the unemployed, it is vital to consider the underemployed (see pp. 24-28 in the Root Causes Report).

The region has 173,800 "available" workers. (Monroe and Tippecanoe counties, as well as the nine counties of EGR 5, are part of the Indy Partnership. The inclusion of Monroe and Tippecanoe counties in the study does not negate its usefulness for the root causes analysis. The two counties are small in proportion to the EGR 5 total, and they are within the region's commuting zone.) The report looks at three sorts of people. The first is the unemployed, of whom there are about 44,600 in the region. In addition to the unemployed, there are about 106,900 underemployed people. They are employed, but willing to change jobs. They may be working part time but prefer full-time work, or they may not be using their skills in their current job. The third category is people who are not in the labor market, but who could be attracted by the right conditions. There are about 22,300 of these.

More than 106,000 workers in the region indicated the willingness to change jobs. The chart at right shows the distribution of underemployed workers by the wage that they said they would accept. The majority of workers are willing to take new jobs in the $10- to $20-an-hour wage bracket. The largest response was from workers willing to take a new position for between $10 and $10.99 an hour. The underemployed workers in EGR 5 represent a resource to meet the shortages in our critical occupations.



Current data from the Local Area Unemployment Statistics data series show that about 44,000 people are unemployed in EGR 5. Although the Indy Partnership report looks at a slightly larger area, the findings are useful in describing and understanding the unemployed labor supply. The following facts emerge from the survey:

- 25 percent are laid off from their job
- 28 percent lost employment due to cutbacks
- 28 percent have postsecondary education
- 43 is the average age of the unemployed.

The unemployed labor force is very fluid. Although the number of unemployed may exceed 40,000 for consecutive months, the same people do not remain unemployed. Most are off the rolls in less than 15 weeks, as shown at

right. Half of all unemployed people nationwide find work again in less than nine weeks. Only about 20 percent of all unemployed, or about 8,800 people in EGR 5, are chronic, long-term unemployed. If the nine-week turnaround time for unemployed workers could be shortened to four weeks, it would help the shortages in several of EGR 5's critical occupations.

Duration of Unemployment

Less than 5 weeks	36.1 %
5 to 14 weeks	30.4 %
15 to 26 weeks	14.0 %
27 weeks and longer	19.5 %

Source: Bureau of Labor Statistics

The 22,300 potential re-entrants also are worth considering. These people are not working and not looking for work, but would re-enter the labor force if certain conditions were met. Most are female, and their skills and experience are strong in health care. Their wage demands can be met at low levels. Twenty-five percent would come back to work for $8.99 an hour or less. Seventy-five percent of all re-entrants would come back to work for $15.42 an hour or less.

Money income, however, is not the only consideration. Survey respondents rated five factors "extremely important" in their decision to re-enter the labor force or change jobs. These five factors were:

- Insurance benefits
- Financial stability of the company
- Retirement benefits
- Salary
- Opportunity for advancement.

A large number of experienced workers live in EGR 5 and are willing to re-enter the labor force. Their expectations do not seem unreasonable. This suggests that we do not have a genuine labor shortage, but simply a poorly functioning labor market. People do not know about the opportunities available to them.

The educational capacity factor

The region's educational capacity is deficient in one area: nurses and medical professionals. This theme was sounded repeatedly and discussed at length by our consortium. The details are discussed later in the full report with pages devoted to each occupation, but a brief explanation is appropriate here.

There are too few instructors for the nursing programs. Qualified instructors for nursing education and for the allied medical professions must have at least a Master of Science in Nursing degree. Many must have a Ph.D. in a medical specialty. Central Indiana has many such individuals, but few of them are willing to teach. Instructors earn as much as $15,000 a year less than they can earn in medical practice. The postsecondary institutions have pay schedules, and the amounts they are authorized to pay are insufficient to attract enough instructors. In addition to the bottleneck in the medical studies classroom, there also is a bottleneck in the clinical phase.

Educational capacity varies for each of the occupations EGR 5 selected. This is due to the amount of work required by the institutions to offer the programs needed to achieve the degree or certification. For example, educational capacity for the automotive, manufacturing and logistics occupations appears not to be a problem.

Ivy Tech Community College of Indiana meets the demand through its regular course offerings and through its office of Corporate and Continuing Education. Such courses sometimes fit into degree programs, and other times stand alone. One example is the R.N. Refresher Course offered by Ivy Tech-Central Indiana, which enables former RNs to renew their proficiency through self-directed, computer-based study and a 16-day clinical experience. A second example of Ivy Tech's flexibility is the developing motor sports program.

Central Indiana employers interviewed for this report said Ivy Tech satisfies the need for worker training. Most said their employees had participated in standard courses rather than courses designed especially for the company.

Ivy Tech is the largest of several players in postsecondary education in our region for the 13 critical occupations. Others include Lincoln Technical Institute and ITT Technical Institute, especially for automotive specialists. Marian College and Indiana University-Purdue University at Indianapolis have large nursing programs.

Except in the health professions, educational programs are not at capacity. Training could be increased by soliciting more students (see pp. 22-23 of the Root Causes Report).

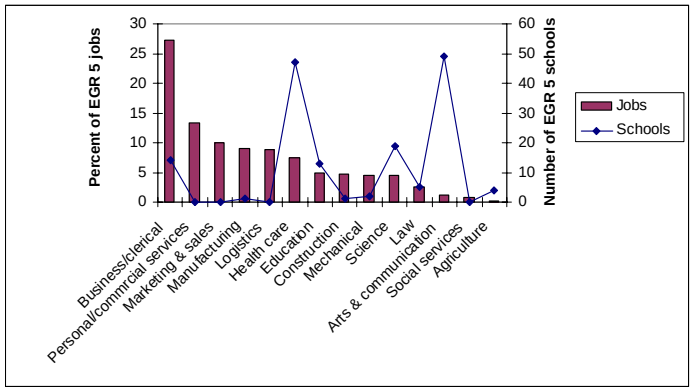
The pipeline factor

We can say that the pipeline is full for only three of our 13 critical occupations – the medical professions. For all the others, there are serious problems in the supple of current and future workers.

A major part of this is the image of the industries (see pp. 28-29 of the Root Causes Report).

The problem starts in our high schools.

The Learn More Research Center Web site lists the top career choices of Indiana high school juniors. The chart at right compares the jobs in EGR 5 with the interest that students show in those jobs. The chart shows a serious mismatch between students' interests and the actual job market.



Students responding to the survey evinced an interest in only five occupational clusters. Every one of the 51 high schools reporting listed "arts, audio-visual technology and communications" as a top choice. This career cluster represents 1.1 percent of jobs in the region, but 20 percent of Indiana students expect to work in this cluster. A second top choice – given at 49 of 51 schools – was "health care." The health care industry is one of the area's largest, but the health care professions (doctors, nurses and medical technicians) represent only about 7.5 percent of all jobs.

At the other end of the student-interest scale, manufacturing production, personal services, marketing and sales, and logistics garnered negligible interest among students. A single school listed manufacturing production as a top career choice. The five critical manufacturing production occupations in EGR 5 all are affected by the low interest in production jobs. The same is true for logistics. Considering that manufacturing production jobs pay some of the best overall wages, students' disdain for manufacturing is irrational.

The National Association of Manufacturers validates this local finding with its national research, and says that image is the problem: "Research has shown a direct relationship between manufacturing's negative image – which is tied to the old stereotype of the assembly line – and the decreasing number of young people pursuing careers in the industry." (2005 Skills Gap Report – A Survey of the American Manufacturing Workforce, Deloitte and The Manufacturing Institute, 2005, p. 2.)

Manufacturing's problem is not that young people are not learning the necessary skills. Many are. Manufacturing's problem is that the young people who are learning the essential skills do not seek careers in manufacturing.

The skill shortage for the majority of EGR 5's critical occupations is not caused by a lack of people. It is simply that many people, when they plan their short- and long-term career changes, overlook these occupations.

The Hispanic/Latino workforce factor

We added this factor to the list. It turns out not to be an important root cause of skill shortage in any of our critical occupations, but the Hispanic/Latino workforce may be a part of the solution (see pp. 33-34 of the Root Causes Report).

There are between 80,000 and 100,000 Hispanics/Latinos in Indianapolis and the surrounding counties of EGR 5. That is only about 6 percent of the population, but Hispanics/Latinos constitute up to 12 percent of the labor supply for some occupations. They are nearly all recent immigrants who are here to work. They have the work ethic that many employers say is lacking in the native-born American population. Hispanic/Latino workers have a very good reputation today – especially in logistics and manufacturing.

Hispanic/Latino workers face two particular problems. The first is immigration status. Most Hispanics/Latinos in central Indiana do not have full authorization to work in the United States. The exact number of illegals is unknown, since social service providers and employers often do not ask their status.

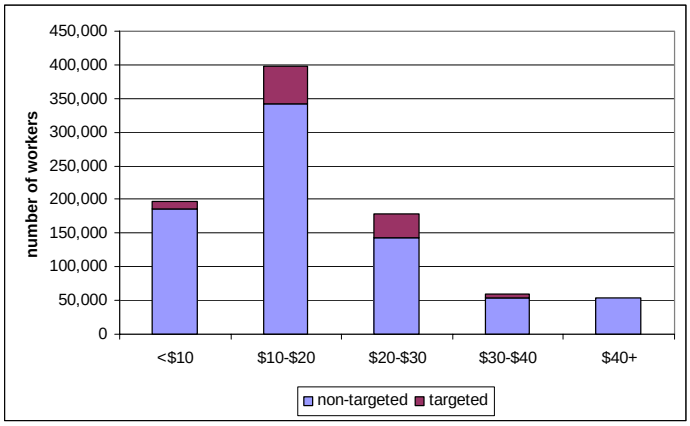
The second issue for Hispanic/Latino workers is English-language training. Many current Hispanic/Latino workers are in entry-level jobs that require little English, but their future advancement potential depends on language proficiency. Most Hispanics/Latinos want to learn English, but would rather earn money than take classes. Larger companies have begun to teach workers on site and during the work shift.

In addition, difficulty in obtaining a driver's license has been a discouragement to some Hispanic/Latino workers. One employer cited transportation as the No. 1 problem. In all likelihood, this problem affects logistics more than other sectors, because warehouses often are located outside the city center where the Hispanic/Latino workers live.

The wage factor

Wages are a "problem" for the medical professions (registered nurse, allied medical professions and licensed practical nurse), and also for automotive service technician and production machine operator. In the medical professions, a qualified person can earn more money in practice than by teaching. Very often, people are willing to take a pay cut to work in more amenable surroundings, but the difference in this case is up to $15,000 per year. That is enough to keep qualified instructors out of the classroom.

Wages vs. other occupations



If wages for one occupation are significantly higher than for another, workers will be attracted to it. The flow of workers is, or course, constrained by information, training capacity and other factors. But, in general, economic laws say that relative wages determine supply.

The chart at right shows where the critical occupations fall in the overall wage distribution of earnings in EGR 5. The targeted occupations account for about 20 percent of all jobs in the $20-$30 wage bracket; 14 percent of those in the $10-$20 bracket; and smaller shares of the other brackets. The targeted occupations have a higher wage balance than the overall wage distribution.

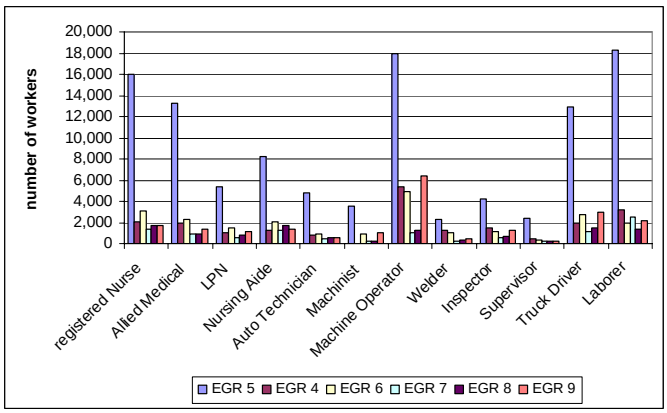
Generally, the critical occupations pay similar wages to other jobs that require similar education, training, skill, experience or preparation. The question is too complex to address fully in this summary. A more specific answer for each critical occupation is provided below, under the sections for each occupation (see pp. 15-18 of the Root Causes Report).

Wages vs. other regions

In general, our region pays as well or better than the surrounding regions. We compared EGR 5 with regions 4, 6, 7, 8 and 9. The data show that wages in EGR 5 are not always higher than those of the surrounding regions for particular occupations. Of the 12 occupations studied here, only one is unambiguously higher in EGR 5 than in the other regions. This is licensed practical nurses. In all other occupations, our region falls out of top place in at least one level of the wage distribution. EGR 5 does not always pay higher wages than the surrounding regions. But it often does (see pp. 12-13 of the Root Causes Report).

EGR 5 relies on inbound commuters for a substantial share of its total workforce. Our ability to attract more workers to fill the current and projected shortfalls depends in part on our ability to attract inbound workers. A prospective worker living 50 miles from a job in EGR 5 would have daily driving costs of about $8. The extra time spent driving to and from work would be worth about one hour of wages. Thus a rational worker earning $15 an hour in his home county would require at least $2.88 an hour more to work in EGR 5 instead. A worker who earns $30 an hour in her local labor market would demand at least $4.75 an hour more in order to commute.

EGR 5 employers rarely offer wage premiums of this magnitude. They pay competitive wages, and often the best wages among the regions. Yet they seldom pay the large premiums shown to be necessary to attract rational workers.



The sheer number of jobs helps explain in-migration. The chart at right compares the number of EGR 5 jobs to those of the separate regions surrounding it. For every occupation, EGR 5 employment is larger than in any of the other regions, and often greater than the sum of the other regions.

The number of openings is a function of the number of jobs. A larger region has more openings. So a worker who lives in any of the outlying regions may expand the field of opportunity by looking for work in EGR 5.

Consider the case of a registered nurse living in EGR 7, which lies west of EGR 5. Within her region are about 1,300 nursing jobs. By expanding her job search northward to region 4 and southward to region 8, the number of jobs is increased by about 400 percent to 5,030. But if that nurse looks to EGR 5, the number of jobs ex-

pands by more than 1,000 percent. Thus, any worker who is willing to commute will be drawn toward EGR 5, as long as the wages are not a disincentive.

To sum up, wages for most occupations provide a sufficient incentive for workers within EGR 5 but not strong enough to induce workers to leave similar jobs in their home region and work in EGR 5 instead. On the other hand, the large number of opportunities here probably draws workers who are willing to commute or migrate.

We believe that the people in our region (including the wider commuting zone) are sufficient to meet our workforce demands if they get the right training. Interstate comparisons (which were suggested during the first webinar) would have been pursued if out-of-state recruitment were a part of our workforce strategy.

There are only two areas where central Indiana employers look outside the region. One of these is nursing. The nursing shortage is chronic throughout the United States, and employers have gone global in their search for nurses. The second area is entry-level labor, where Hispanic/Latino workers are filling the gaps. EGR 5 wages are much higher than those individuals could earn at home.

The importance of wages and benefits

Wages are the most obvious factor in determining the supply of workers for an occupation. If it pays wages that are significantly higher than alternatives, then the occupation will attract enough workers. If it doesn't, it won't. These statements are generally true, but they don't explain everything. Factors other than the wage differential also are important to individuals.

We have heard numerous tales of individuals changing jobs at a pay cut. One did so because she was tired of the traffic on Interstate 465 and preferred to work on the side of town where she lives. Another took a cut of $3 an hour to get away from the sub-zero temperatures in the cold storage warehouse where he had worked. A third accepted a substantial cut in wages in exchange for the full medical benefits provided by his new employer. It is very definitely proven that $2 or $3 an hour more is not always enough to draw people from one workplace to another, or from one job to another. Nevertheless, higher wages expand the labor supply, all things being equal.

The human resources capacity factor

Probably some employers lack the ability to find available workers. In general, though, we found that employers in EGR 5 have adequate capacity to find workers (see pp. 9-11 of the Root Causes Report).

Human resources capacity varies from firm to firm. Some firms are very aggressive and sophisticated; others have no policies at all. Previous research in central Indiana and across the United States explains why some companies perform the human resources function better than others. The main factor is the size of the company. Firms with fewer than 50 employees seldom have a full-time professional managing personnel and human resources, while those with more than 100 employees nearly always do.

All hospitals exceed the threshold of 100 employees where HR capacity expands to meet the need. The majority of logistics firms and manufacturers also employ 100 or more. Many ambulatory care facilities and doctor's offices are very small and may have HR incapacities.

In 2004, the Indianapolis Private Industry Council, in conjunction with the Greater Indianapolis Chamber of Commerce, surveyed employers about their human resources needs. Employers were asked what kinds of business services they might need. A majority or near-majority of employers in the survey admitted deficiency in basic personnel management.

The survey data, recent regional interviews and published wisdom point to one conclusion. To the extent that employers of a critical occupation tend to be new companies or small companies, human resources capacity is an issue.

New recruitment tactics

Employers may get poor results from their recruitment efforts because they do not understand the job candidates. According to the National Association of Manufacturers, many employers think good wages are the key to recruitment, while job candidates expect much more. The report identifies some encouraging trends. Several unusual perquisites have become influential in recruiting and retaining workers (see pp. 10-11 of the Root Causes Report).

Wages and health care benefits are used by a majority of employers as a means of attracting and retaining workers. A second tier of tactics (retirement benefit and improved corporate culture) are common among nearly half of companies, if the Manufactures' survey is representative. Perhaps most interesting is the third tier of tactics, which now are used by 15 percent to 26 percent of employers. These emerging practices appeal to the workers' desire for personal development. They include various kinds of training and flexible work schedules.

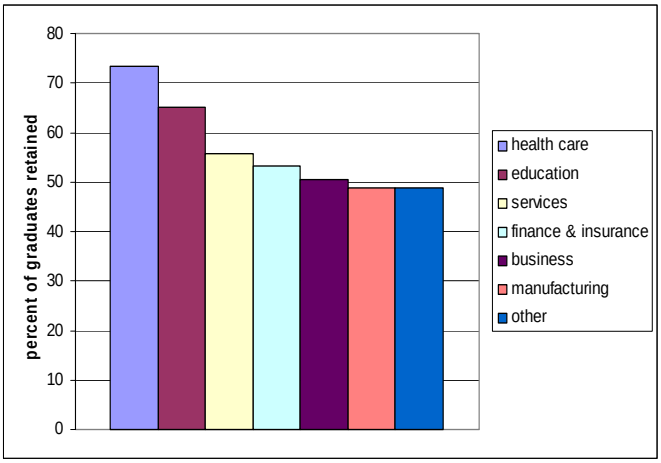
EGR 5 also has its share of new tactics for recruiting and retention. Consider the trucking company that recruits husband-and-wife driving teams as a response to the complaint that driving keeps one away from his or her loved

one. Or consider the hospital group that recruits nurses internationally, most recently in Ireland. The developing Indiana Motorsports Association plans to develop the ability to recruit the best automotive technicians from the technical schools, in the same way that top accounting firms recruit from the best business schools.

The brain drain factor

Indiana ranks very low among the states (47th in 2004) in the percentage of its adults who have college degrees. Indiana's low ranking would be understandable if the state lacked capacity to provide college degrees to its citizens. But Indiana ranks high (16th among the states) in college enrollment capacity. Relative to its size, Indiana churns out 19.9 percent more bachelor's degrees each year than the national rate. Yet the state remains low in the share of adults with college degrees. Indiana has stood at 47th place in the ranking of states since 1998.

Forty-two percent of the people who get bachelor's degrees from Indiana colleges leave the state within 18 months of graduating. Some of these are out-of-state students who return home after getting their degrees. But most are Hoosier students who grow up and study here, then leave.



Indiana's 42 percent loss rate is much higher than most other states. Illinois loses 18.4 percent. Kentucky loses 19.8 percent. Across the nation, states lose on average only 28.7 percent of their graduates. College graduates are mobile. But Indiana loses more than any of its neighboring states.

The brain drain is a serious issue. But it does not have a strong effect on EGR 5's critical occupations. Most of the occupations require less than a bachelor's degree. Those that require a bachelor's degree are in the medical professions, where Indiana's brain drain is less serious.

The chart above shows that health care has a relatively good rate of retention rate of 73.5 percent. This is better than the overall national rate at which graduates stay in the state where they receive their degree. Indiana's retention in the health care sector appears to be about average; there is no brain drain in health careers.

Manufacturing rates low. Fewer than half of the individuals who receive a bachelor's degree relating to manufacturing remain in the state afterward to work in an Indiana company.

The brain drain is an important factor in Indiana's labor exchange. But it is not critical for the 13 critical occupations in EGR 5. Although we have no data specific to EGR 5 or to the 13 critical occupations, the information discussed here shows that the labor shortages are not a brain drain supply problem. The critical occupations mostly do not require college degrees. The exception to this assertion is health care. In that area, Indiana has a high retention rate (see pp. 30-32 of the Root Causes Report).

IV. Root causes for the critical occupations

In the following pages we describe the root causes for each of EGR 5's 13 critical occupations; explain their relative importance in addressing the skill shortages; provide evidence as to how the root cause was identified; rank each root cause; provide qualitative assessment of the sensitivity of the projected future shortages to changes in the root cause; and make a quantitative estimation of the reaction of future shortages.

Registered nurses

HR capacity	2
Wages and benefits	**4**
Educational capacity	**4**
The pipeline	1
Brain drain	2
Hispanic/Latino workforce	3

There aren't enough instructors. Nursing is a popular job, and there are plenty of programs. But only about half of the qualified applicants can get into nursing school. The problem is caused by the difference in wages between medical practice and classroom instruction. A person qualified to teach nursing – someone with a Ph.D., or at least a M.S.N. degree – can earn up to $15,000 more in the hospital than in a nursing school. The instructors' wages are set by administrative policy at each nursing school or college, and they aren't responsive to the market. Clearing this bottleneck could reduce the shortage of nurses by 50 to 100 percent within five years.

Most nurses work in hospitals: large businesses with sophisticated capacity for recruitment and staff development. Some EGR 5 employers cast their net worldwide to find qualified people. They pay extra to nurses willing to work unpopular shifts. In addition to the hospitals' internal hiring methods, central Indiana has auxiliary capacity in the form of professional employer organizations that specialize in nursing and other medical occupations. Services such as Nurse Finders and others enhance the internal capacities of the hospitals.

Wages for nurses in EGR 5 are competitive with what other regions pay. In comparison with other occupations that require an associate's degree or a bachelor's degree, nursing pays well. Some nurses make less than teachers and other professionals, but overall the wage scale for registered nurse is attractive.

High school students are very interested in medical careers, including nursing. The number of applicants far exceeds the number of seats available (see pp. 35-37 of the Root Causes Report).

Allied medical professions

HR capacity	1
Wages and benefits	**4**
Educational capacity	**4**
The pipeline	1
Brain drain	2
Hispanic/Latino workforce	2

The problem for allied medical professions, which includes a wide variety of technicians and technologists, is similar to that of registered nurses. Too few people are getting licensed to meet the demand. Many qualified applicants are turned away from the schools. So we deduce that there is plenty of interest in the pipeline. The root problem lies in the educational capacity. Clearing this bottleneck could reduce the shortage by 50 to 100 percent within five years (see pp. 38-40 of the Root Causes Report).

The other factors affecting allied medical professions are similar to those of registered nurses. Briefly, the pipeline is full, but the schools cannot turn out enough graduates to meet the demand. The wages for allied medical professions are good, both in comparison to other regions and to other occupations within EGR 5. There isn't much of a brain drain for medical professions.

Technologists and other allied health professionals work in hospitals, most of which have very sophisticated human resources programs. Even more than with nurses, human resources capacity is not a problem in the hiring of allied medical professionals. One hundred percent of respondents to the job vacancy survey report using the Internet as one of several methods to recruit technologists.

EGR 5 wages for allied medical professionals are competitive with surrounding regions. Although the wages paid in EGR 9 exceed our region at every point on the wage scale, EGR 5 is above the other four regions.

Indiana has a serious brain drain overall, but not for the health care professions. This does not mean that we lose none of our medical graduates. There is a normal rate of loss that occurs in most states. Indiana's loss of medical professionals appears to be near that normal rate.

Licensed practical nurses

Once again, this occupation is similar to registered nurse and allied medical professions. There is a bottle neck in training. If all the qualified applicants to the nursing programs were admitted and graduated, the current shortage would diminish. Clearing this bottleneck could reduce the shortage of nurses by 50 to 100 percent within five years.

HR capacity	2
Wages and benefits	**4**
Educational capacity	**4**
The pipeline	1
Brain drain	2
Hispanic/Latino workforce	3

Licensed practical nurses are used almost exclusively in large institutions where HR capacity is fully developed.

There is a clear wage advantage for licensed practical nurses in EGR 5. The region pays the highest wages among all the contiguous regions. Despite the wage advantage over neighboring regions, there still is a wage problem. The shortage of qualified instructors affects licensed practical nurses, for the same reasons described above.

Students often are turned away from nursing colleges. There is a high interest in the occupation, but not enough instructors to teach all who are interested (see pp. 41-42 of the Root Causes Report).

Nursing aides

HR capacity	2
Wages and benefits	3
Educational capacity	1
The pipeline	3
Brain drain	1
Hispanic/Latino workforce	2

Nursing aide is a health support occupation. Unlike the three previous jobs, it does not require extensive education. There is no problem with educational capacity here. Instead, the problem lies with the pipeline leading to the profession. Few people are interested in this unglamorous job. Further, the nursing aide's wages are often less than a similar person could earn in clerical work, retail or other industries.

Nursing aides are employed in hospitals and nursing homes. These are

large employers with well-developed HR capacity.

Nursing aides in EGR 5 earn a competitive wage in comparison with aides in the surrounding regions. However, the occupation pays less than many other occupations available to people with postsecondary certifications. Better wages and benefits could eliminate the shortage over time.

The CNA certificate is easily obtained and does not pose the same barrier to entry that exists for other health practice occupations. Many CNAs obtain their certification while working at a hospital or nursing home.

Few young people are interested in a career in health care support occupations. Many wish to enter into a health care profession, but the nursing aide position is not attractive. Certified nursing assistants typically do not study for certification immediately after high school, but try for other positions and then fall back on nursing aide work if they cannot succeed elsewhere (see pp. 43-44 of the Root Cause Report).

Automotive service technicians

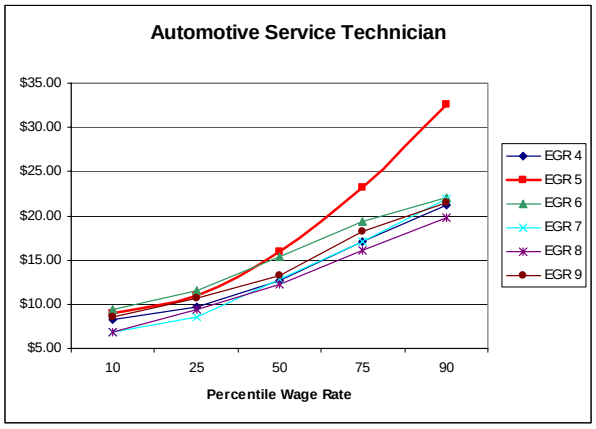
Automotive service technicians include ordinary mechanics and service technicians as well as the more sophisticated staff of racing teams and design shops serving the motor sports industry. The big problems elsewhere – educational capacity and pipeline – are not so serious here (see pp. 45-47 of the Root Causes Report).

HR capacity	3
Wages and benefits	2
Educational capacity	2
The pipeline	3
Brain drain	3
Hispanic/Latino workforce	2

The automotive technician is vital to the development of a motor sports cluster in central Indiana. Most trained technicians will serve as ordinary automotive repairers, but the best should be available to work for racing teams and automotive research companies. One expert involved with the motor sports cluster say that the Indiana Motorsports Association someday will recruit the best students coming out of each class of technical and science courses. But that capability has not yet been developed.

Wages for service technicians are higher in EGR 5 than in the surrounding regions. The advantage is especially great at the "top-end" of the wage distribution (see chart at right). Clearly, some top employers in EGR 5 are bidding up the best experienced workers. As the recruiting capacity develops, so too must the pipeline for this occupation. The supply will grow along with the prestige of the occupation.

The necessary training for automotive service technicians is provided by both state and proprietary institutions. This combination ensures that the educational capacity is flexible and adequate.



Automotive service technician has a substantial career ladder. Certification may be obtained only from a technical school or college, but many kinds of experience can contribute to learning and competence. Informal "helping out" around the shop, internships and apprenticeships all are possible in the automotive field. People who are committed to working in racing may volunteer for racing teams or with the venues.

The automotive technician is chiefly a certified position, but scientific and engineering degrees may be added to augment the skill.

Technical positions have a substantial rate of out-migration after graduation from Indiana colleges and postsecondary institutions. This does not apply to certified mechanics, but to all engineering and scientific degrees.

Machinists

Machinist is a skilled position requiring years of training and practice. Few young people today consider manufacturing to be an appealing career option. Although labor union training programs traditionally have provided most machinist training, this capacity is not fully utilized. The shortage of machinists could be fully eliminated over 5-8 years by expanding the supply of applicants.

HR capacity	3
Wages and benefits	3
Educational capacity	2
The pipeline	**5**
Brain drain	1
Hispanic/Latino workforce	3

All the regions of wider central Indiana are very close in the distributions of wages for machinists. EGR 5 does not appear to have an advantage over the other regions for this occupation.

Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are capable of adapting their course offerings rapidly as new technologies emerge. The manufacturers of

production equipment also provide training specific to their machinery. EGR 5 has capacity to educate and train enough workers for production occupations. The best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs.

As with all the other manufacturing-related occupations, there is a dearth of young people entering the pipeline for training for machinists.

Hispanic/Latino workers are performing well in many production jobs. No data exist to specify how many are skilled machinists (see pp. 48-50 of the Root Causes Report).

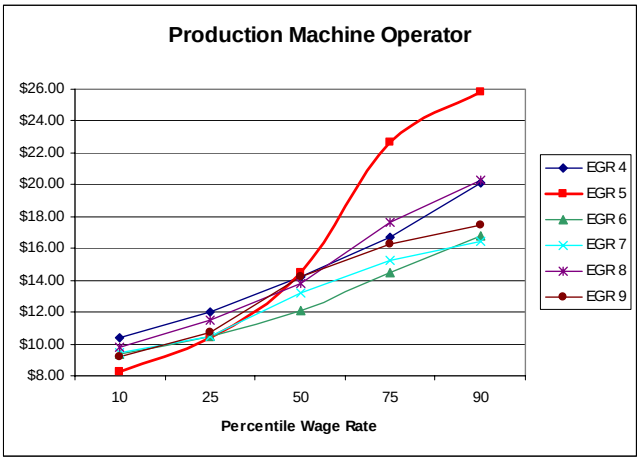
Production machine operators

HR capacity	3
Wages and benefits	**4**
Educational capacity	2
The pipeline	**5**
Brain drain	1
Hispanic/Latino workforce	3

The shortage of workers in this occupation begins at the mouth of the pipeline. Few young people desire a career in manufacturing. There is plenty of capacity for training, but not enough people taking it (see pp. 51-52 of the Root Causes Report).

Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

The manufacturers of production equipment also provide training specific to their machinery. These equipment companies usually train the workers of every company that buys from them to ensure that the equipment is used optimally and that their customers are satisfied.



EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs.

Machine operators earn a substantial premium in EGR 5 compared with neighboring regions. We observe, however, that the advantage appears only at the higher levels. At the lower points on the distribution, EGR 5 actually pays the least of any region in the comparison.

Nearly 12 percent of Hispanic/Latino workers are in productions jobs (Marion County only). No data exist to specify how many are skilled machine operators. Still, this occupation draws one of the highest rates of Hispanic/Latino participation of the occupations studied. The shortage of machine operators could be eliminated within five years.

Welders

HR capacity	3
Wages and benefits	2
Educational capacity	2
The pipeline	**5**
Brain drain	1
Hispanic/Latino workforce	3

Few young people consider a career in welding. The rate of turnover among welders is high for manufacturing, less high for construction. And since welding requires both training and experience, the supply is not sufficient.

Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs.

Many firms that employ welders are small. These employers typically will not have a full-time human resources director and a strong HR policy. Such firms tend to hire walk-in applicant with little screening.

EGR 5 does not pay the highest wages for welders. EGR 5's wages for welders ranks second or third at every point in the wage curve for welders. EGRs 6 and 7 provide higher wages for welders for at least part of the distribution.

As noted in all the manufacturing/production occupations, the pipeline for welders suffers from a poor reputation, leading to low interest by the best students. Expanding the pipeline is the key to eradicating this skill shortage.

Nearly 12 percent of Hispanic/Latino workers are in productions jobs (Marion County only). No data exist to specify how many are welders. Still, this occupation draws one of the highest rates of Hispanic/Latino participation of the occupations studied (see pp. 53-55 of the Root Causes Report).

Precision inspectors and testers

HR capacity	3
Wages and benefits	2
Educational capacity	2
The pipeline	**4**
Brain drain	1
Hispanic/Latino workforce	3

Nearly all inspectors are promoted from within. There is no training for inspectors, except on-the-job training.

The reliance on hires from within shows that the hiring practices for inspectors is not highly sophisticated. It might be argued, however, that promoting from within is the ideal means of choosing inspectors, since people who have experience producing a part will understand how to check it against specifications.

The job of inspector and tester has a significant pipeline. Inspectors take the job after spending time at one or more production jobs. As inspectors, they must monitor the quality of work with which they are familiar from experience. An inspector who has wider experience within a plant will be more valuable.

EGR 5 pays the best wages for experienced inspectors.

Training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

The manufacturers of production equipment also provide training specific to their machinery. These equipment companies usually train the workers of every company that buys from them to ensure that the equipment is used optimally and that their customers are satisfied.

EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs. The skill gap in this occupation can be eliminated through training (see pp. 56-57 of the Root Causes Report).

Chemical machine operators

The data from the survey indicate that hiring for chemical production jobs is limited to a few employers. Chemical technicians and chemical process operators earn a substantial premium in EGR 5 compared with other similar occupations.

HR capacity	2
Wages and benefits	2
Educational capacity	2
The pipeline	**5**
Brain drain	1
Hispanic/Latino workforce	3

It was not possible to generate a comparison of chemical technician positions. The regions surrounding EGR 5 have few chemical producers and the data were suppressed for all the surrounding regions.

As mentioned above, training for advanced manufacturing skills is available through both public and proprietary institutions. The latter are extremely flexible and are capable of adapting their course offerings rapidly as new technologies emerge.

The manufacturers of production equipment also provide training specific to their machinery. These equipment companies usually train the workers of every company that buys from them to ensure that the equipment is used optimally and that their customers are satisfied.

EGR 5 has capacity to educate and train enough workers for production occupations. The problem is that the best minds are required in today's advanced production occupations, and few of the best students today choose to study for technical or production jobs. Indeed, manufacturing is very unpopular as a career choice among central Indiana high school students (see pp. 58-59 of the Root Causes Report).

Supervisor of transportation workers

HR capacity	3
Wages and benefits	2
Educational capacity	3
The pipeline	**4**
Brain drain	1
Hispanic/Latino workforce	3

Supervisors usually are promoted from within. They are chosen because they do a job well, but when they are promoted to a new position they may need leadership training. The shortage in this occupation is due to lack of skill, not the number of potential applicants.

The positions are filled by selecting from among the line workers. For this reason, there are always candidates for the position of supervisor. The skill gap in this occupation can be eliminated through training.

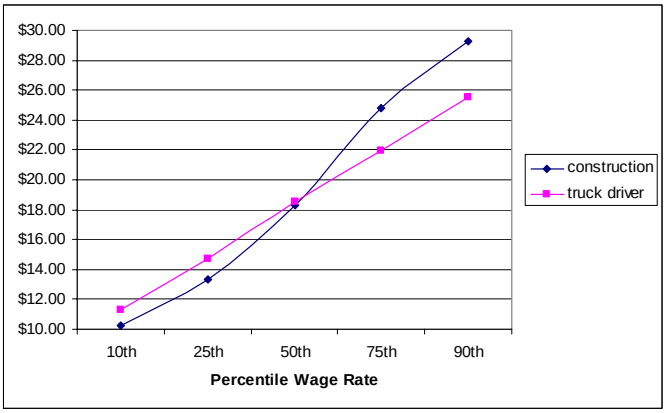
Few Hispanics/Latinos have risen to supervisory positions in the logistics sector. As the overall workforce incorporates more Hispanic/Latino workers, it would be advisable to discover latent talent for leadership among the line workers (see pp. 60-61 of the Root Causes Report).

Truck drivers

HR capacity	2
Wages and benefits	**4**
Educational capacity	2
The pipeline	**4**
Brain drain	1
Hispanic/Latino workforce	3

Truck driving is difficult and stressful. Unless trucking paid significantly better than other occupations, we would expect a shortage of drivers. Trucking doesn't pay as well as construction, and so there is a shortage (see pp. 62-66 of the Root Causes Report).

Wages for truck drivers generally are higher in EGR 5 than in the surrounding regions. However, they are lower than the pay rates in the construction industry (see chart at right). The wage scale for truckers lies below that for all construction workers from the median wage upward. Although average wages for construction and for truckers are similar, the complete wage curve shows truckers' wages falling short. Construction outbids trucking for the more experienced or more talented half of workers.



Training facilities are adequate for building up the trucking fleet in EGR 5. Data provided by the Indiana Bureau of Motor Vehicles show that commercial driver's licenses in EGR 5 have increased in each of the two previous years.

Training is prohibitively expensive for many potential drivers. A typical CDL training course runs six to 10 weeks and usually costs several thousand dollars. However, the cost of training often is deferred or paid outright by trucking companies in search of drivers. Only independent, owner-operator face this financial challenge.

More than two-thirds of truck drivers are white males, who are only about one-third of the labor force. A part of the strategy for meeting the need for truckers is to increase participation by women, blacks and Hispanics/Latinos.

Safety and security regulations have increased in recent years, and these heightened regulations make it harder for some people to obtain the commercial driver's license. Among the regulations are hazardous materials endorsements; English-language requirement; prohibition against drivers with high blood pressure; mandatory minimum training; limited hours of service; screening of driver's history; H2-B provisions for immigrant workers; and North American Free Trade Agreement trucking provisions.

One unusual feature of the trucking career is the delayed entry into the occupation. A driver must be at least 23 years old before beginning a career of interstate hauling. The commercial driver's license may be obtained at age 21, and then two years of experience are required before the driver is qualified for long-haul interstate work. An 18-year-old who is interested in becoming a trucker must wait three years before beginning to realize that ambition and five years before actually participating.

Since the pipeline for young people to move into a trucking career is hampered by this regulation, most trucking companies attempt to fill vacancies by recruiting from competitors. Often the strategy involves assuring truckers that they will have weekends at home on a regular basis, that they will never have to load or unload their trailer or that other, similar amenities or advantages are in the offing.

Warehouse laborers

HR capacity	3
Wages and benefits	2
Educational capacity	2
The pipeline	**5**
Brain drain	1
Hispanic/Latino workforce	3

The shortage of laborers is caused by high turnover among the available labor force (see pp. 67-69 of the Root Causes Report).

Logistics employers in EGR 5 pay premium wages for warehouse and courier service laborers. Our region pays better for both starting laborers and for the most experienced workers.

Laborers in general have no requirement for education or professional certification. However, some employers require employees to have a high school diploma or general equivalency degree. Assisting potential employees to obtain these certificates would help reduce the shortage of laborers by expanding the pool of potential workers.

Laborer is an entry-level position. There is no pipeline leading into it, except the willingness to do the work with a good ethic. For immigrant workers, training in English language can be beneficial.

Another major factor limiting the supply of laborers is transportation. Many urban residents are willing and qualified to work in distributions centers, but cannot get to the job. In EGR 5, most of these potential workers live in Marion County. Most of the new logistics jobs are in the surrounding counties, especially Hendricks, Hancock and Shelby. Public or mass transit does not extend to these areas or, in the case of distribution hubs at the Indianapolis International Airport, do not operate during the overnight hours when distribution centers are busiest.

Hispanics/Latinos are favored by employers for warehouse occupations. Male and female workers are both in demand for warehousing and courier positions. Many positions are physically demanding and require especially fit individuals. The skill gap for laborers must be solved through a combination of improved wages and benefits, and efforts to improve the image of logistics occupations. Either effort can achieve little without the combination.

V. Closing the gaps: how much, how sure?

Certain of the root causes contribute substantially to the skill shortages in the critical occupations. None of them acts independent of the labor market, however, and none is the pure or sole cause of shortage. The table shows the qualitative certainty that a change in the root cause factor would reduce the skill gap in our region, and estimates the magnitude of the reduction.

Occupation	Sensitivity	Skill gap reduction	Occupation	Sensitivity	Skill gap reduction
Registered nurse	High	50-100%	Welder	Moderate	50-75%
Allied medical	High	50-100%	Inspector	High	75-100%
LPN	High	50-100%	Chemical operator	Moderate	50-75%
Nursing aide	Moderate	50-75%	Supervisor	High	75-100%
Auto technician	Moderate	50-75%	Truck driver	High	50-75%
Machinist	Moderate	50-75%	Laborer	Moderate	50-75%
Machine operator	Moderate	50-75%			

Solving the root problem will not close the skill gap in every case. Secondary causes may remain after the root causes is solved. For example, a root cause of the shortage in production occupations is the poor image of manufacturing, which discourages talented young people from entering the field. The result is loss of productivity and diminished wages for beginners in production jobs such as welder. Improving the image of welding might raise interest among young people, but cannot close the gap unless starting wages for welders are attractive. Closing the skill gap completely will require changes in a combination of factors.

VI. Regional Coalition and Industry Partner Engagement

Members of EGR 5's regional consortium were continually involved during the development of the Root Causes report. To ensure that members were kept apprised of the Root Causes process and were given ample opportunity to contribute, staff developed coordination and communication plan for the Root Causes phase that included:

- Biweekly updates to lead team and consortium members
- Lead team project update meetings
- Individual meetings with lead team members and their invited industry experts
- Review of draft Root Causes report by consortium members
- Interviews with various industry representatives as recommended by lead and consortium members
- Lead team approval of Root Causes report.

EGR 5 regional consortium is geographically diverse and includes individuals from the public workforce system, business, local economic development programs, chambers, educational entities and labor. The determination of root causes was truly regional in that EGR 5 staff routinely solicited input from individuals throughout the region, including representatives of private industry; local economic development; training; and higher education. Staff also interviewed industry partners and regional coalitions and reviewed several regional reports. These activities contributed to a broader understanding of the root causes affecting the 13 critical occupations evaluated by EGR 5 and the development of a truly regional Root Causes report.

EGR 5 lead team members have graciously given their time and talent to this project. Lead team members have further demonstrated their support by submitting the attached letters of support, which endorse the SSI process and validate the findings of EGR 5's Root Causes report.